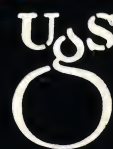


SHEETROCK PYROFILL *Cost 24-25¢ sq' 1933* **AND WEATHERWOOD PYROFILL** **ROOF CONSTRUCTION**



UNITED STATES GYPSUM COMPANY





Sheetrock-Pyrofill and Weatherwood-Pyrofill Roof Constructions

The Sheetrock-Pyrofill Roof Deck is a reinforced gypsum roof construction poured-in-place over permanent Sheetrock forms. There are no joints for heat loss, and the monolithic construction helps stiffen the building structure.

The weight of Sheetrock-Pyrofill roof construction is but $11\frac{1}{2}$ pounds per square foot for a six-foot purlin spacing, and $12\frac{1}{2}$ pounds per square foot for an eleven foot purlin spacing. Regardless of how great the spacing is between purlins, the gypsum spans only $32\frac{1}{2}$ inches—the spacing between sub-purlins. The sub-purlins are designed on the basis of standard beam formulae to carry the total live and dead load.

In load tests conducted by Columbia University, more than 500 pounds per square foot uniformly distributed load was required to break the $2\frac{1}{2}$ -inch thick Sheetrock-Pyrofill roof slabs. This is an exceptionally strong, durable construction.



The undersurface of the Sheetrock-Pyrofill Roof Deck consists of Sheetrock 32 inches wide, in lengths equal to the purlin spacing so that end joints occur over the main purlins. With the Sheetrock joints thus concealed, a smooth, attractive, light-reflecting undersurface results.

The Weatherwood-Pyrofill Roof Deck construction, except for the substitution of Weatherwood for Sheetrock for the permanent forms, is identical with the Sheetrock-Pyrofill construction.

The undersurface of the Weatherwood-Pyrofill construction consists of either $\frac{1}{2}$ -inch or 1-inch thick Weatherwood insulating board 32 inches wide and in lengths equal to the purlin spacing. Thus all end joints occur over the main purlins.

The sub-purlins used in these two roof deck constructions are light rails or tees laid at right angles to the

in purlins and spaced approximately 32½ inches on centers and clipped to the main purlins.

The reinforcing in the gypsum slab is a continuous, electrically welded, galvanized steel fabric, especially made to USG specifications, with No. 12 longitudinal wires 4 inches on center, and No. 14 transverse wires 8 inches on center.

After the reinforcing has been placed over the Sheetrock or Weatherwood permanent forms, Pyrofill is

poured and screeded to the proper thickness, making the total depth of slab 2½ or 3 inches including the thickness of the form. Pyrofill consists of gypsum stucco, water, and 12½ pounds of fiber to 87½ pounds of calcined gypsum. Pyrofill weighs only 50 pounds per cubic foot.

Curbs, end walls, etc., are usually constructed of Precast Gypsum Tile. Curbs may also be made of Sheetrock-Pyrofill or Weatherwood-Pyrofill construction.

OUTSTANDING ADVANTAGES

Adaptability

Whenever steel framing is used (whether the roof be flat, 45° pitched, monitor, sawtooth, Pond, Aiken, etc.) the inherent value of either Sheetrock-Pyrofill or Weatherwood-Pyrofill construction may be advantageously employed.

Fireproof

The inherent advantages of gypsum for fireproofing are universally recognized.

Light Weight

For standard slab thicknesses and sub-purlin sizes Sheet-rock-Pyrofill and Weatherwood-Pyrofill construction weighs only 10 to 12½ lbs. per square foot (see table on page 7). This light weight, as compared with other masonry construction, permits savings throughout the structure, including columns and footings.

Appearance

The smooth undersurface with uniform paneled effect is singularly pleasing to the eye.

NOTE: If the underside of the slab is to be painted or otherwise decorated, such work should not be done until the waterproof roof covering has been applied and the slab is thoroughly dry.

Economical

The simplicity of the construction, plus the light weight and the speed with which it is installed makes either Sheetrock-Pyrofill or Weatherwood-Pyrofill Roof Construction extremely economical.

No Maintenance

Calcined gypsum is chemically inert. Examinations of steel rods embedded for fifteen years in gypsum have shown no evidence of progressive corrosion. There is no maintenance cost under ordinary conditions of use.

Pyrofill is poured in place on either flat or moderately pitched roofs



Screeding the Pyrofill which has been poured over the Sheetrock form and reinforcing



High Insulation

Gypsum is among the highest in insulating value of the fireproof structural building materials. It is effective in protecting the building from extremes of outside temperature, both in summer and in winter.

The following table gives the heat loss through various types of roof construction expressed in B.T.U.'s per hour, per square foot, per degree difference in temperature. All values are figured with a 5-ply roof covering, except corrugated Sheet Iron:

Corrugated Sheet Iron (no roof covering)	1.50 B.T.U.'s
1 $\frac{5}{8}$ " Cement Tile	.68 "
3" Stone Concrete	.61 "
2" Pine Plank	.34 "
2 $\frac{1}{2}$ " Sheetrock-Pyrofill	.38 "
3" Sheetrock-Pyrofill	.35 "
2 $\frac{1}{2}$ " Weatherwood-Pyrofill ($\frac{1}{2}$ " board)	.26 "
3" Weatherwood-Pyrofill (1" board)	.19 "

SPECIAL ADVANTAGE

WEATHERWOOD-PYROFILL ROOF CONSTRUCTION has the special, additional and unique advantage of providing a high degree of acoustical absorption. This is particularly important in auditoriums, gymnasiums and similar buildings, but is also of considerable importance in many types of factories and industrial buildings.

The approximate acoustical absorption provided is as follows:

$\frac{1}{2}$ " Weatherwood30%
1" Weatherwood45%

ECONOMICAL CONSTRUCTION SUGGESTIONS

Length of Span

Usually a span of approximately 8 ft. between main purlins with a 2 $\frac{1}{2}$ -inch slab thickness will be found most economical.

If channels are used as main purlins on sloping roofs, they should open upwards to permit proper clipping of the sub-purlins with our No. 4 purlin clip.

Uniformity of Span

By preserving uniformity of span, labor costs are reduced and standard lengths of Sheetrock or Weatherwood may be used.

Pitch of Roof

While flat roofs require less labor than steep ones, the difference up to 30° pitch is not of sufficient importance to warrant serious consideration. On a roof, however, over 45° pitch, it may be necessary to back-form from the top in order to obtain a satisfactory job. This will obviously add to the cost of the roof.

Sheetrock-Pyrofill and Weatherwood-Pyrofill Roof Deck construction can be specified with assurance of an excellent job.

MASTER SPECIFICATIONS

SHEETROCK-PYROFILL AND WEATHERWOOD-PYROFILL ROOF CONSTRUCTIONS

NOTE—Notes are explanatory or advisory only and should not be included in the specifications.

(1) WORK INCLUDED

NOTE—Here list the various roof areas to be constructed of Sheetrock-Pyrofill or Weatherwood-Pyrofill and specify the prescribed live load. If live loads vary, designate the live load applying to the various areas.

(2) SUPPORTING STRUCTURAL STEEL WORK

All steel work for the support of the Sheetrock-Pyrofill Roof Construction has been designed not only to carry the prescribed live and dead loads, but to accommodate the most economical installation in accordance with the standard details of the United States Gypsum Company.

(3) MATERIALS

(3a) GENERAL—All Gypsum products shall be as manufactured by the United States Gypsum Company, 300 West Adams Street, Chicago, Illinois.

(3b) SUB-PURLINS — Sub-purlins shall be steel (tees) (rails) of sizes and spacings required or indicated on the structural plans, furnished with a shop coat of paint. Provide all necessary clips (of types best suited to conditions) for rigidly securing sub-purlins to main purlins, etc.

(3c) SHEETROCK FORMS — Sheetrock (32 inches wide) shall be mill-made to exact lengths (maximum 10 ft.) to match the main purlin centering.

(3d) WEATHERWOOD FORMS — Weatherwood (½ inch) (1 inch) thick x 32 inches wide shall be mill-made to exact lengths (maximum 10 ft.) to match the main purlin centering.

(3e) REINFORCEMENT — Steel reinforcement shall be galvanized electrically-welded steel fabric made to USG specifications consisting of No. 12 main longitudinal wires 4 inches on centers and No. 14 transverse wires 8 inches on centers having an effective sectional area of .026 sq. in. per foot width of slab.

(3f) PYROFILL — Pyrofill shall consist of calcined gypsum and 12½ lbs. of clean soft wood fiber to every 87½ lbs. of gypsum. The gypsum and wood fiber shall be mill mixed. Water for proper consistency shall be added at the job.

(3g) PRECAST CURB TILE — Where so indicated on plans and details furnish 3-in. thick precast gypsum curb tile (reinforced when carrying a roof load or retaining drainage fill). For end wall construction where so indicated furnish Pyrobar Gypsum Curb Tile (3-in. x 15-in., x 30-in. non-reinforced).

(3h) GYPSUM MORTAR — Gypsum mortar shall consist of one part of unfibred gypsum cement plaster and not to exceed two parts of clean sharp sand.

(4) ERECTION

(4a) GENERAL — All (Sheetrock-Pyrofill) (Weatherwood-Pyrofill) Roof Construction including all sub-purlins (curbs) (end walls) (saddles) (drainage fill), etc., shall be completely erected by the Engineering Sales Division of the United States Gypsum Company.

Roof construction shall be inches thick, including the thickness of the Sheetrock or Weatherwood. All joints in sub-purlins shall be staggered or rigidly tied together. Reinforcement shall be continuous. All roof surfaces shall be screeded smooth and true ready to receive the finished waterproof roof covering.

(4b) POURED CURBS — All curbs so indicated on plans and details shall be constructed of (Sheetrock-Pyrofill) (Weatherwood-Pyrofill).

(4c) TILE CURBS — All curbs so indicated on plans and details shall be constructed of precast gypsum curb tile (reinforced when carrying roof load or retaining drainage fill) set in gypsum mortar.

(4d) END WALLS, ETC. — Construct all (end walls) of (monitors) (sawtooth skylights) ("A" frames) (specify) of Pyrobar Gypsum Curb Tile set in gypsum mortar.

(4e) DRAINAGE FILL — Provide Pyrofill saddles and drainage pitches to direct roof drainage to (gutters) (drainage outlets).

(5) WATERPROOF ROOF COVERING

NOTE — Provide in the Roofing and Sheet Metal division of the specifications that the waterproof roof covering shall be applied as soon as possible after the Sheetrock-Pyrofill slab is erected (preferably within twenty days).

University of Chicago Field House, Chicago, Ill.
Architects, Holabird & Root, Chicago, Ill.

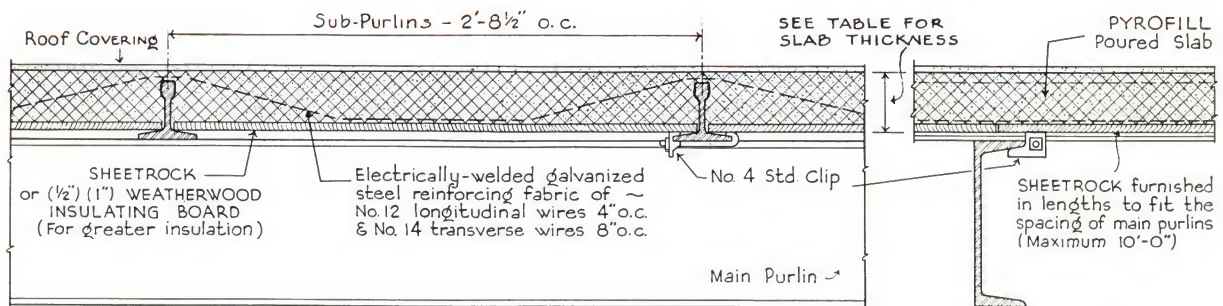


Undersurface of Weatherwood-Pyrofill Roof on
University of Chicago Field House

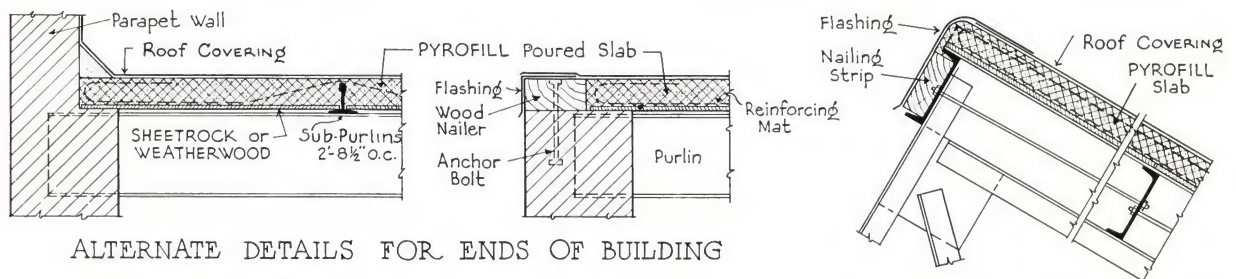


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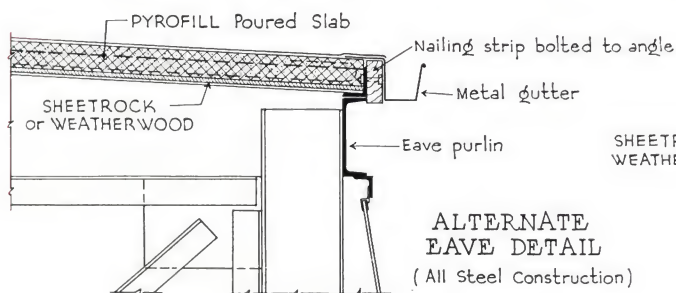
AND WEATHERWOOD PY



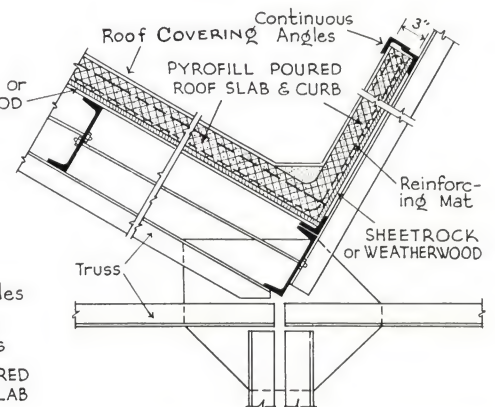
TYPICAL SHEETROCK OR WEATHERWOOD PYROFILL CONSTRUCTION



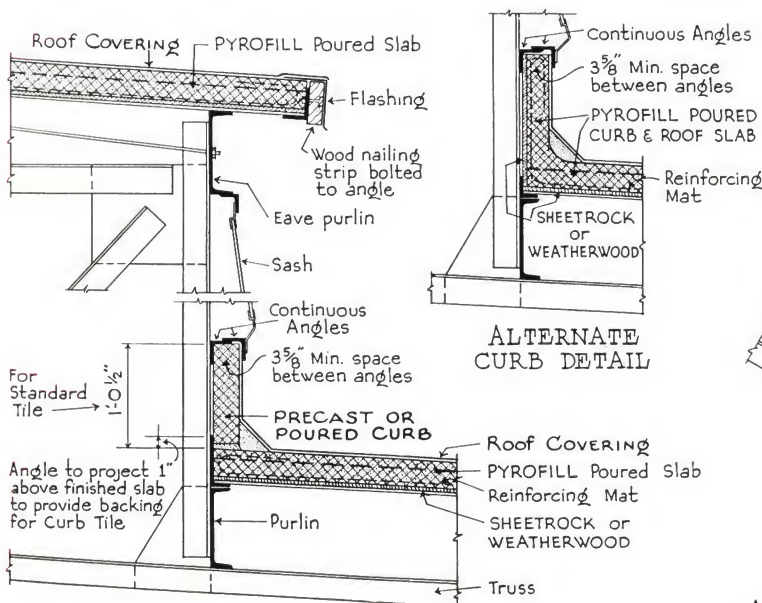
ALTERNATE DETAILS FOR ENDS OF BUILDING



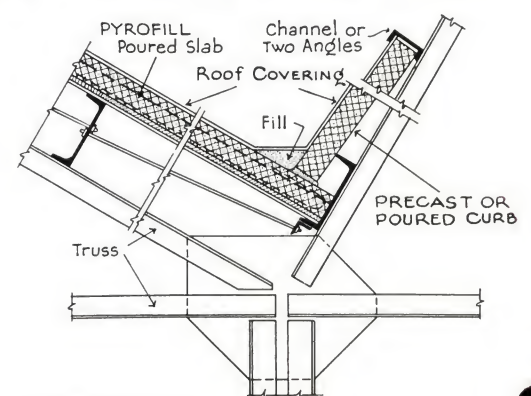
SAWTOOTH PEAK CONST'N.



SAWTOOTH GUTTER CONST'N.

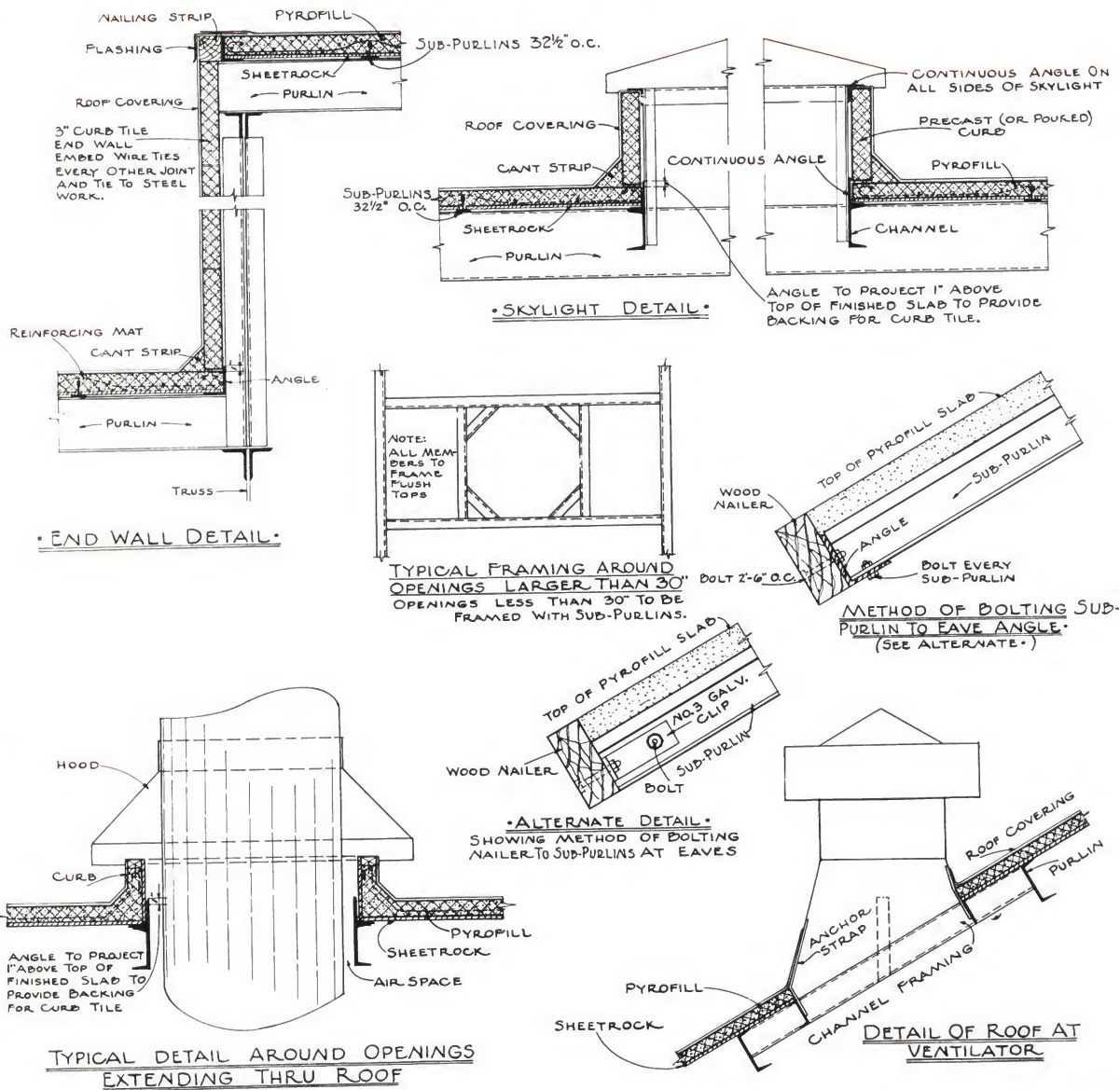


CURB & EAVE CONSTRUCTION FOR MONITOR



ETROCK-PYROFILL

ROOF FILL CONSTRUCTIONS



SUB-PURLIN SIZES AND WEIGHTS OF SLABS

Sub-Purlins Spaced 32 1/2" Total Load — 45 Lbs. per Sq. Ft. M = 1/10 WL

Size of Sub-Purlin (Weight per Yard)	Allowable Span		Weight of Sub-Purlins in lbs. per sq. ft. of Roof	Weight of Slab Including Sub-Purlins					
	18,000 lbs. per sq. in. Sub-Purlin Stress	20,000 lbs. per sq. in. Sub-Purlin Stress		Sheetrock Pyrofill		Weatherwood Pyrofill			
				Minimum Slab Thickness*	Weight in lbs. per sq. ft.	Min. Slab Thickness*		Wt. persq.ft.in lbs.	
						1/2" Bd.	1" Bd.	1/2" Bd.	1" Bd.
No. 178 U.S.G. 8 LB. BULB TEE	6'-6"	6'-10"	1	2½"	11.5	2½"	3"	10.0	10.5
No. 218 U.S.G. 8.3 LB. BULB TEE	7'-7"	8'-0"	1.02	2½"	11.5	2½"	3"	10.0	10.5
12-Lb. Rail	8'-11"	9'-3"	1.5	2½"	12.0	2½"	3"	10.5	11.0
16-Lb. Rail	11'-2"	11'-6"	2	2½"	12.5	2½"	3"	11.0	11.5
20-Lb. Rail	13'-3"	13'-8"	2.5	3"	15.0	3"	3"	13.5	12.0

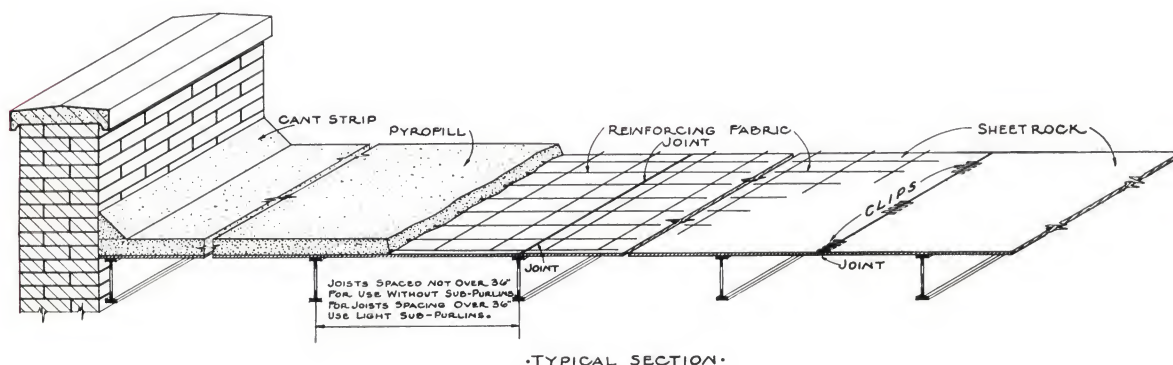
*Total Slab Thickness Including Sheetrock or Weatherwood . . . Minimum Thickness of Pyrofill 2".

SHEETROCK PYROFILL OR WEATHERWOOD PYROFILL ROOF AND FLOOR CONSTRUCTION OVER STEEL JOISTS OR JUNIOR BEAMS

The Sheetrock-Pyrofill and Weatherwood-Pyrofill type of construction may also be used advantageously for floors or roofs over light steel beams or bar joists. No sub-purlins are required if the steel spacing does not exceed 36 inches. For steel spacing over 36 inches suitable light sub-purlins are used.

The reinforcing and construction of the slab are the same as the standard construction and therefore the same economies and advantages apply.

This construction will be found economical in light occupancy buildings wherever light steel beams or bar joists are used.



SPECIFICATIONS

(See Master Specifications)

All roofs (and floors) shall consist of the United States Gypsum Company's Sheetrock (and/or Weatherwood) Pyrofill construction. Where steel spacing is 36" or less no sub-purlins will be required.

Where steel spacing exceeds 36" provide sub-purlins of sufficient strength to carry the required load.

Sheetrock (Weatherwood) board in lengths to span over two or more supports shall be laid over the supporting steel with the ends held in alignment by means of special clips as manufactured by the United States Gypsum Company.

Over the Sheetrock (Weatherwood) board lay an electrically welded, galvanized reinforcing mat with No. 12 longitudinal wires at right

angles to the supporting steel 4" on centers and No. 14 cross wires 8" on centers.

Over the board and reinforcing mat pour a Pyrofill (gypsum fiber concrete) slab to a minimum depth of 2 inches. The slab shall be screeded smooth and left clean ready for the application of the waterproof roof covering (floor finish).

Note—When linoleum or composition floor covering is used over this gypsum construction include in the floor covering specification the following:

Before applying floor covering the gypsum floors shall be covered by a 1/4" minimum thickness coating of the United States Gypsum Company's Pyrotop, a prepared underlayment and leveling material to be trowelled in place in strict accordance with the manufacturer's directions.

U.S.

UNITED STATES GYPSUM COMPANY
300 WEST ADAMS STREET, CHICAGO, ILLINOIS



United States Gypsum

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